



PHYSICS

BOOKS - NTA MOCK TESTS

NTA NEET SET 34

Physics

1. An H- atom in the ground state is excited by monochromatic radiation of photon energy

13.056 eV. The number of emission lines will be
(given its ionisation energy is 13.6 eV)

A. one

B. two

C. four

D. ten

Answer: D



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2. If the radius of a nucleus with mass number 125 is 1.5 fermi then radius of nucleus with mass number 64 is

A. 0.48 fm

B. 1.92 fm

C. 1.2 fm

D. 1.2 fm

Answer: D



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3. A man of 80 kg attempts to jump from the small boat of mass 40 kg on to the shore. He can generate a relative velocity of 6 m/s between him and boat. His velocity towards shore is

A. $4ms^{-1}$

B. $8ms^{-1}$

C. $2ms^{-1}$

D. $3ms^{-1}$

Answer: C



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4. A body moving with uniform acceleration describes 40 m in the first 5 s and 70 m in the next 5 s.its initial velocity will be

A. $4ms^{-1}$

B. $2.5ms^{-1}$

C. $5ms^{-1}$

D. $11ms^{-1}$

Answer: C



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5. A road is 10 m wide. Its radius of curvature is 50 m . The outer edge is above the lower edge by a distance of 1.5 m . This road is most suited for the velocity

A. $8.5ms^{-1}$

B. $6.5ms^{-1}$

C. $5.5ms^{-1}$

D. none of these

Answer: A



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6. Relative permeability of iron is 5500 . Its magnetic susceptibility is

A. 5499

B. 5500×10^7

C. 5500×10^{-7}

D. 5501

Answer: A



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7. In a potentiometer, a uniform potential gradient of $0.8V\,m^{-1}$ is maintained across its 10 m wire . The potential difference across two points on the wire located at 65 cm and 2.45 m is

A. 1.44 V

B. 0.144 V

C. 1.96 V

D. 0.196 V

Answer: A



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8. In an electrical cable there is a single wire of radius 9mm of copper. Its resistance is 5Ω . The cable is replaced by 6 different insulated copper, wires the radius of each wire is 3mm . Now the total resistance of the cable will be

A. 7.5Ω

B. 45Ω

C. 90Ω

D. 270Ω

Answer: A



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9. If the magnetic field is parallel to a surface then, the magnetic flux through the surface is

A. zero

B. small but not zero

C. infinite

D. large but not infinite

Answer: A



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10. The surface density of charge on the surface of a charged conductor in the air is $26.5\mu C m^{-2}$. The the outward force per unit

area of the charged conductor is

$$(\epsilon_0 = 8.85 \times 10^{-12} C^2 N^{-1} m^{-2})$$

A. $3.5 Nm^{-2}$

B. $17.7 Nm^{-2}$

C. $8.85 Nm^{-2}$

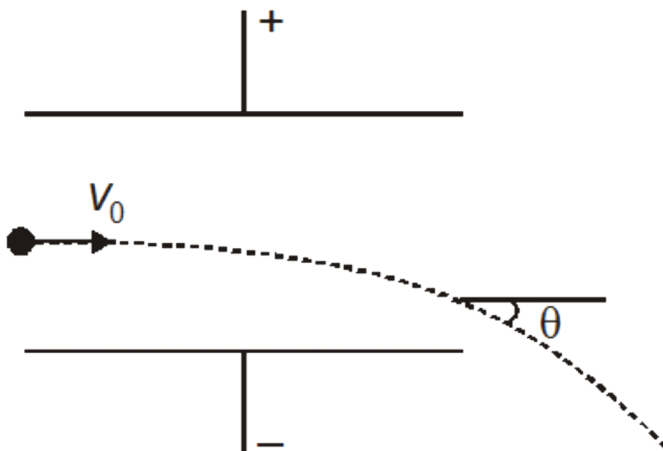
D. $39.7 Nm^{-2}$

Answer: D



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11. when a positively charged particle is projected with a velocity v_0 in the region between the horizontal plates of the capacitor then it leaves by making an angle θ with the horizontal, as shown. If $\theta = \theta_1$ is for proton and $\theta = \theta_2$ for an α - particle then the value of $\frac{\tan \theta_1}{\tan \theta_2}$



A. 1

B. $\sqrt{2}$

C. 2

D. $\frac{1}{\sqrt{2}}$

Answer: C



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12. The height at which the acceleration due to gravity becomes $\frac{g}{9}$ (where g = the acceleration

due to gravity on the surface of the earth) in terms of R , the radius of the earth, is :

A. $2R$

B. $\frac{R}{\sqrt{3}}$

C. $\frac{R}{2}$

D. $\sqrt{2R}$

Answer: A



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13. An artificial satellite is moving in a circular orbit around the earth with a speed equal to half the magnitude of escape velocity from the earth. The height of the satellite above the surface of the earth is xR . Find the value of x .

A. R

B. $2R$

C. $3R$

D. $4R$

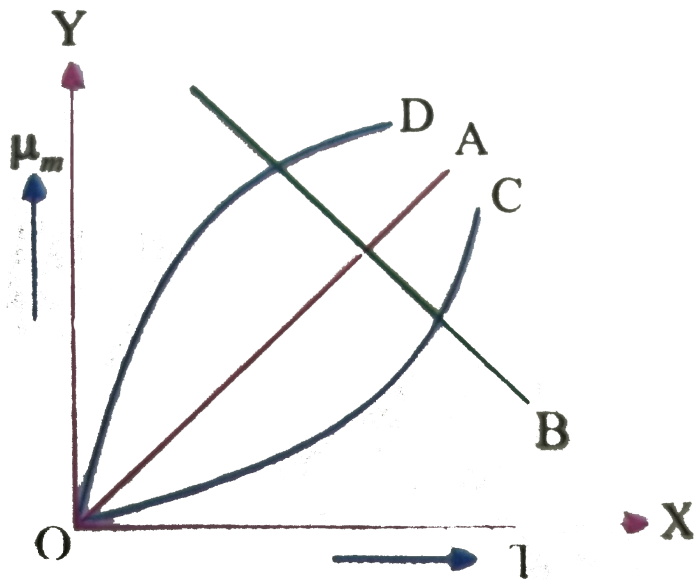
Answer: A



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14. The frequency (ν_m) corresponding to which energy emitted by a black body is maximum may vary with temperature T of the body as shown in Which of the curves

represents correct variation ?



A. A

B. B

C. C

D. D

Answer: A



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15. A clock which keeps correct time at $25^{\circ} C$, has a pendulum made of brass. The coefficient of linear expansion for brass is $0.000019.^{\circ} C^{-1}$. How many seconds a day will it gain if the ambient temperature falls to $0.^{\circ} C$?

A. 20.52 s

B. 15.00 s

C. 52.10 s

D. 63.10 s

Answer: A



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16. The temperature of 5 mol of gas which was held at constant volume was change from 100°C to 120°C . The change in internal energy was found to ve 80 J . The total heat

capacity of the gas at constant volume will be equal to

A. $8JK^{-1}$

B. $0.8JK^{-1}$

C. $4JK^{-1}$

D. $0.4JK^{-1}$

Answer: C



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17. Two circular coils mounted parallel to each other on the same axis carry steady currents. If an observer between the coils reports that one coil is carrying a clockwise current i_1 while the other is carrying a counter-clockwise current i_2 then the two coils experience

- A. a steady repulsive force
- B. zero force
- C. a repulsive force

D. a steady attractive force

Answer: D



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18. A stream of electrons is projected horizontally to the right. A straight conductor carrying a current is supported parallel to the electron stream and above it. If the current in the conductor is from left to right, what will be the effect on the electron stream?

- A. The electron stream will be speeded up
towards the right
- B. The electron stream will be retarded
- C. The electron stream will be pulled
upwards
- D. The electron stream will be pulled
downwards

Answer: D



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19. The speed of a boat in still water is 15 km / hr and the rate of current is 3 km / hr . The distance travelled downstream in 12 minutes is

A. 1.2 km

B. 1.8 km

C. 2.4 km

D. 3.6 km

Answer: D



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20. There is a small hole at the bottom of tank filled with water. If total pressure at the bottom is $3atm$ ($1atm = 10^5 Nm^{-2}$), then find the velocity of water flowing from hole.

A. $\sqrt{400}ms^{-1}$

B. $\sqrt{600}ms^{-1}$

C. $\sqrt{60}ms^{-1}$

D. none of these

Answer: B



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21. An iron nail of mass 0.2 kg is dropped from a height $h=1\text{m}$ from level of a sand bed. If it penetrates through a distance $x=0.1\text{m}$ in the sand before coming to rest. Calculate the average force exerted by the sand on the nail.

(Take $g=10\text{m} / \text{s}^2$)

A. $mg\left(\frac{h}{x} + 1\right)$

B. $mg\left(\frac{x}{h} + 1\right)$

C. $mg\left(\frac{h}{x} - 1\right)$

$$D. mg\left(\frac{x}{h} - 1\right)$$

Answer: A



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22. A sample of ${}_{53}I^{131}$, as I^{\ominus} ion, was administered to a patient in a carrier consisting $1.0mg$ of stable I^{\ominus} ion. After 4.0 days, 60% of the initial radioactivity was detected in the thyroid gland of the patient. What mass of the stable I^{\ominus} ion had migrated

to the thyroid gland? (Given: $t_{1/2}$ of $I^{131} = 8$ days)

A. 65.8 %

B. 95. %

C. 85.8 %

D. 75.8 %

Answer: B



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23. The position of a particle moving along x-axis is given by $x = x_0 \cos^2(\omega t)$. Its when it is at mean position is

A. $2x_0\omega$

B. $x_0\omega^2$

C. $\frac{x_0\omega}{2}$

D. $x_0\omega$

Answer: D



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24. An electromagnetic wave of frequency $\nu = 3.0\text{MHz}$ passes from vacuum into a dielectric medium with permittivity $\epsilon = 4.0$.

Then

A. wavelength is doubled and the frequency remains unchanged

B. wavelength is doubled and frequency becomes half

C. wavelength is halved and frequency remains unchanged

D. wavelength and frequency both remain unchanged

Answer: C



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25. A tank of height H is fully filled with water. If the water rushing from a hole made in the tank below the free surface, strikes the floor at a maximum horizontal distance, then the

depth of the hole from the free surface must
be

A. $\frac{3}{4}H$

B. $\frac{2}{3}H$

C. $\frac{1}{4}H$

D. $\frac{1}{2}H$

Answer: D



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26. the gauge pressure in both tyres of a bicycle is 690 k Pa. If the bicycle and the rider have a combined mass of 90 kg. what is the area of contact of each tyre with the ground? (assume that each tyre supports half the total weight of the bicycle.)

A. $6.39 \times 10^{-4} m^2$

B. $7.39 \times 10^{-4} m^2$

C. $8.39 \times 10^{-4} m^2$

D. $9.39 \times 10^{-4} m^2$

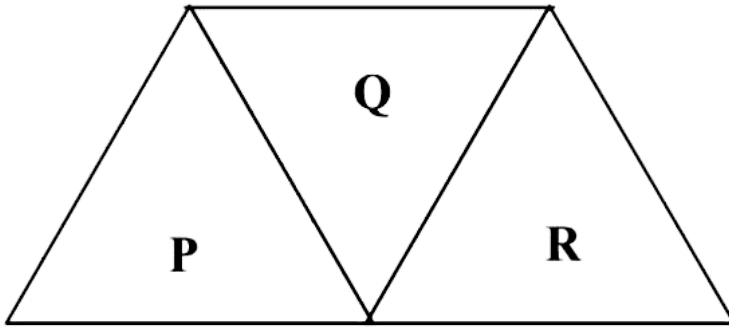
Answer: A



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27. A given ray of light suffers minimum deviation in an equilateral prism P. Additional prism Q and R of identical shape and of the same material as P are now added as shown in

the figure. The ray will now suffer



A. $3\delta_m$

B. $2\delta_m$

C. δ_m

D. zero

Answer: C



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28. Red light of wavelength 6400 \AA in air has a wavelength of 4000 \AA in glass. If the wavelength of violet light in air is 4400 \AA , then the wavelength in glass is

A. 2570 \AA

B. 2750 \AA

C. 1600 \AA

D. 2510 \AA

Answer: B



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29. Two blocks of masses 10 kg and 4 kg are connected by a spring of negligible mass and placed on a frictionless horizontal surface. An impulse gives a velocity of $14m/s$ to the heavier block in the direction of the lighter block. The velocity of the centre of mass is

A. $30ms^{-1}$

B. $20ms^{-1}$

C. $10ms^{-1}$

D. $5ms^{-1}$

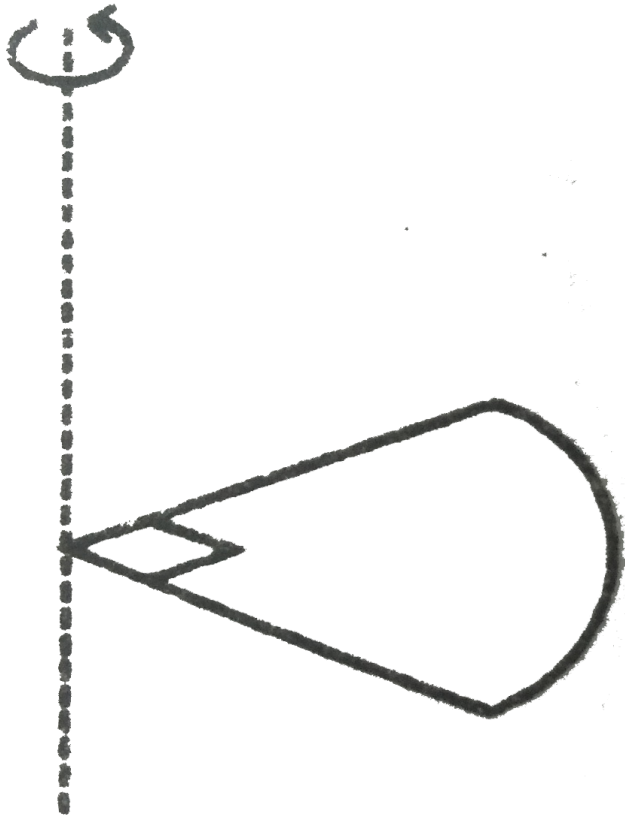
Answer: C



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30. One quarter sector is cut from a uniform circular disc of radius R . This sector has mass M . It is made to rotate about a line perpendicular to its plane and passing

through the centre of the original disc. Its moment of inertia about the axis of rotation is.



A. $\frac{1}{2}MR^2$

B. $\frac{1}{4}MR^2$

C. $\frac{1}{8}MR^2$

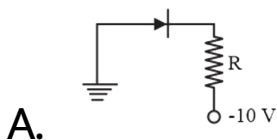
D. $\sqrt{2}MR^2$

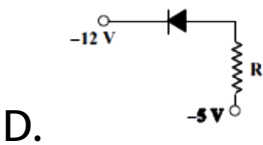
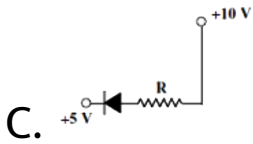
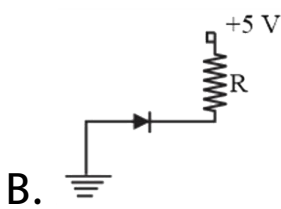
Answer: A



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31. In the following, which one of the diodes is reverse biased ?



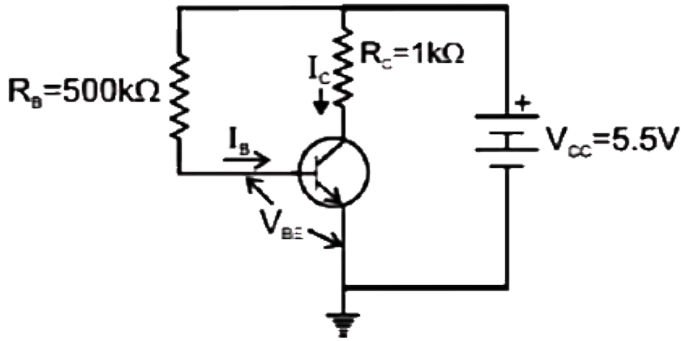


Answer: B

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32. In the circuit shown in figure, the base current I_B is $10\mu A$ and the collector current is

5.2 mA . The voltage (V_{BE}) across the base and emitter is



- A. 0.1 V
- B. 0.5 V
- C. 0.25V
- D. 0.7 V

Answer: B



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33. The specific heat of an ideal gas varies with temperature T as

A. T^1

B. T^2

C. T^{-2}

D. T^0

Answer: D



34. 1kg of water is at 20°C . A resistor of 20Ω is connected across 200V battery and the heat dissipated is supplied to water then the time taken by the water to evaporate is :

(Specific heat = $4200\text{j}/\text{kg}^\circ\text{C}$, Latent heat

$$= 2260\text{k}\frac{\text{j}}{\text{K}}\text{g})$$

A. 3 min

B. 16 min

C. 22 min

D. 10 min

Answer: C



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35. A double-slit apparatus is immersed in a liquid of refractive index 1.33. It has slit separation of 1 mm and distance between the plane of slits and screen is 1.33 m. The slits are illuminated by a parallel beam of light whose wavelength in air is 6300\AA .

a. Calculate the fringe width.

b. One of the slits of the apparatus is covered by a thin glass sheet of refractive index 1.53. Find the smallest thickness of the sheet to bring the adjacent minimum on the axis.

A. 0.95 mm

B. 0.36 mm

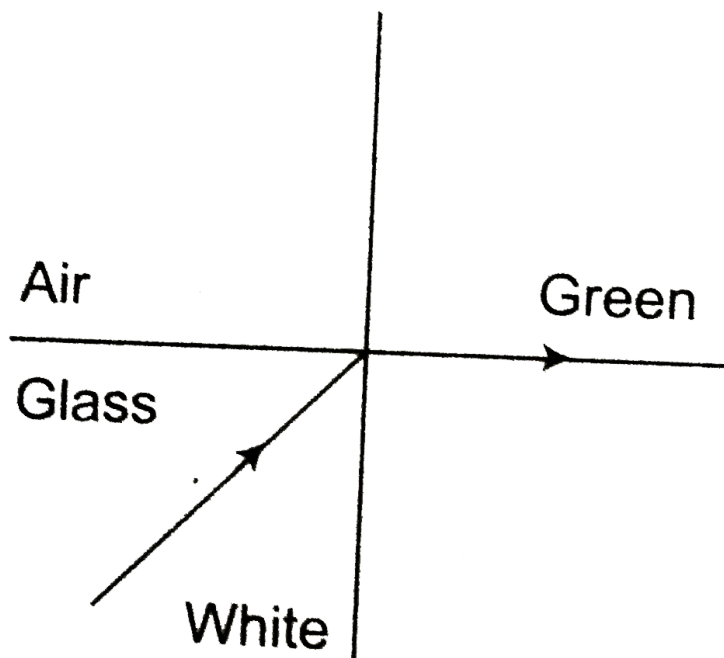
C. 0.63 mm

D. 0.56 mm

Answer: C



36. White light is incident on the interface of glass and air as shown in figure. If green light is just totally internally reflected then the emerging ray in air contains



A. Yellow , orange , red

B. Violet , indigo , blue

C. All colours

D. All colours except green

Answer: A



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37. The frequency of tuning fork A is 2% more than the frequency of a standard tuning fork. The frequency of a tuning fork B is 3% less

than the frequency of the same standard tuning fork. If 6 beat/s are heard when the tuning fork A and B are excited , then frequency of A will be

- A. 120 Hz
- B. 122.4 Hz
- C. 116.4 Hz
- D. 130 Hz

Answer: B



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38. A source of sound of frequency 600 Hz is placed inside water. The speed of sound in water is $1500\text{m} / \text{s}$ and in air it is $300\text{m} / \text{s}$. The frequency of sounds recorded by an observer who is standing in air is :-

A. 200 Hz

B. 3000 Hz

C. 120 Hz

D. 600 Hz

Answer: D



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39. A gas enclosed in a vessel has pressure P , volume V and absolute temperature T , write the formula for number of molecule N of the gas.

A. $\frac{pV}{RT}$

B. $\frac{PV}{kT}$

C. $\frac{pR}{T}$

D. pV

Answer: B



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40. Name the gate , which represents the Boolean expression $y = A \cdot B$ for inputs A, B

A. AND

B. NOR

C. NAND

D. NOT

Answer: A



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41. A particular hydrogen like atom has its ground state Binding energy = $122.4eV$. It is in ground state. Then

A. Its atomic number is 5

B. an electron fo 90 eV can excite it

- C. an electron of kinetic energy 45.9 eV can be brought to almost rest by this atom
- D. an electron of kinetic energy nearly 2.6 eV may emerge from the atom when an electron of kinetic energy 125 eV collides with this atom

Answer: D



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42. In a step-up transformer the voltage in the primary is $220V$ and the current is $5A$. The secondary voltage is found to be $22000V$. The current in the secondary (neglect losses) is

A. $5A$

B. $50 A$

C. $500 A$

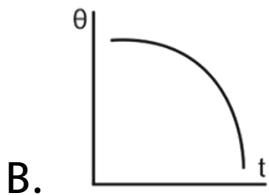
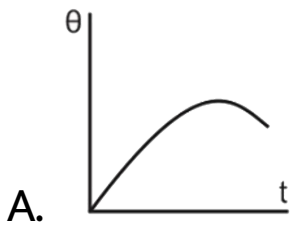
D. $0.05A$

Answer: D

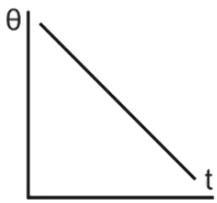


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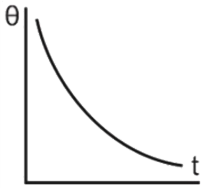
43. The correct graph between the temperature of a hot body kept in cooler surrounding and time is (Assume newton's law of cooling)



C.



D.



Answer: D



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44. A heat engine is a device

A. Which converts mechanical energy into heat energy

B. Which converts heat energy into mechanical energy

C. absorbs heat from a sink at a lower temperature and rejects to the source at high temperature

D. none of above

Answer: B



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45. The operating point of transistor amplifier should be in

A. middle of its active region

B. middle of its saturation region

C. middle of its cut - off region

D. between the cut - off and active region

Answer: A



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